

<b>Notice of Allowability</b>	Application No.	Applicant(s)
	09/943,111	KERFOOT, WILLIAM B.
	Examiner	Art Unit
	HOEY, BETSEY	1724

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTO-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to amendment filed 19 December 2003.
2.  The allowed claim(s) is/are 1-57.
3.  The drawings filed on \_\_\_\_\_ are accepted by the Examiner.
4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All
  - b)  Some\*
  - c)  None
 of the:
  1.  Certified copies of the priority documents have been received.
  2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1.  Notice of References Cited (PTO-892)
2.  Notice of Draftsperson's Patent Drawing Review (PTO-948)
3.  Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5.  Notice of Informal Patent Application (PTO-152)
6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7.  Examiner's Amendment/Comment
8.  Examiner's Statement of Reasons for Allowance
9.  Other \_\_\_\_\_.

1. Newly submitted claims 58-66 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the apparatus recited in these newly submitted claims can be used to practice a method or process other than those recited in claims 9-57. For example, the apparatus could be used to oxidize contaminants in liquid bodies other than those in "soil formations" as recited in claims 9, 16, 26 and 37.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 58-66 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows: claims 58-66 are canceled.

3. Claims 9-57 are allowed.

4. The following is an examiner's statement of reasons for allowance:

Claims 9-15 are allowed because the prior art of record fails to teach, disclose, or fairly suggest a method for removal of contaminants in a soil formation comprising introducing microbubbles of ambient air and ozone into the soil formation such that

contaminants are pulled out of the soil formation through the microbubbles in a vapor state where they react with ozone in the microbubbles.

Claims 16-25 are allowed because the prior art of record fails to teach, disclose, or fairly suggest a method for removal of contaminants in a soil formation comprising introducing ambient air and ozone as microbubbles using microporous diffusers, surrounded by a sand pack disposed between the diffusers and soil formation, in a plurality of injection wells such that contaminants are pulled out of the soil formation through the microbubbles in a vapor state where they react with ozone in the microbubbles.

Claims 26-36 are allowed because the prior art of record fails to teach, disclose, or fairly suggest a process for removing contaminants comprising injecting an oxidizing gas into a site as bubbles that travel through a soil formation in the site, wherein the bubbles have an initial diameter of about 5-200 microns, and the bubbles promote pulling of contaminants in the bubbles to decompose contaminants in a reaction with the gas in the presence of water.

Claims 37-57 are allowed because the prior art of record fails to teach, disclose, or fairly suggest a process for removing volatile organic compounds in a soil formation comprising injecting air including ozone into the soil formation into a sub surface groundwater aquifer as fine bubbles, wherein the initial bubble size is about 5-200 microns, and the bubbles travel through the aquifer with the ozone reacting with the compounds inside the bubbles.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsey Hoey whose telephone number is **(571) 272-1158**. The examiner can normally be reached on Tuesdays and Thursdays from 7:00 AM to 3:30 PM. The examiner's supervisor, Mr. Blaine Copenheaver, may be reached at (571) 272-1156. Any inquiry of general nature may be directed to the Group receptionist at (571) 272-0987. The centralized fax number for the Group is (703) 872-9306. The examiner Rightfax number is (571) 273-1158.

*Betsey M. Hoey*  
BETSEY MORRISON HOEY  
PRIMARY EXAMINER  
March 16, 2004